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**BANDELIER'S RESEARCHES IN PERU AND BOLIVIA**

FREDERICK WEBB HODGE

It is well known, especially by those who have followed the interesting and fruitful studies by this indefatigable investigator of the ethnology and archeology of our southwest and northern Mexico, Mr Adolphe F. Bandelier, that soon after the termination of the work of the Hemenway expedition he proceeded to Peru for the purpose of conducting similar researches in that country. It was through the munificence of Mr Henry Villard, of New York city, that these investigations were initiated in 1892 and continued until early in 1894, when they passed under the auspices of the American Museum of Natural History and were extended into Bolivia.

As Mr Bandelier has already submitted to the Museum a memoir on the results of his observations on the Bolivian islands of Titicaca and Koati, any reference to the later work of this eminent scholar would only anticipate his own elaborate account, which it is hoped will soon be published. As so little is known of Mr Bandelier's operations under the patronage of Mr Villard, however, his fellow-Americans will doubtless be glad to have a brief sketch of his earlier operations in a field so rich in antiquities.

When Mr Bandelier arrived at Lima, in 1892, he at once observed, even in the immediate vicinity of that city, a wealth of archeological material. In the Rimac bottom he saw ruins in every direction, and on some of the valley slopes, as well as along the seashore, there also are numerous vestiges of former aboriginal habitations. It is found, however, that documentary information points to the fact that here, as well as elsewhere, the number of these ruins is an indication of successive and not of contemporaneous occupancy. At the time of the arrival of the Spaniards the most extensive ruins on the Peruvian coast were either completely or at least partially abandoned. This is clear in the case of the so-called Cajamarquilla (even the aboriginal name can no longer be traced), which site was not only deserted but even forgotten in the beginning of the sixteenth century. Irma (or, as it is now called, Pachacamac) was half in ruins in

1532, and Chan-chan, near Truxillo, probably the most extensive of all South American ruins, had dwindled on the arrival of Pizarro to a moderate village at a site called Mansiche, a mile away. The raids of the Incas which were repeated with such pertinacity on the coast tribes from the backbone of the Sierra, cutting off their water supply and impeding their agriculture, and (previously to the rather recent appearance of the Incas) constant warfare between the valley inhabitants had produced the inevitable effects of this disturbing condition—one tribe slaughtered the other and wrecked its abodes, and the once deserted villages were never reoccupied. The so-called depopulation of Peru, Bandelier has happily discovered, is a myth in a sense, for it did not occur *after* the so-called conquest or through that conquest itself.

Owing to the physical peculiarities of the western coast of South America, the districts of that region inhabited by sedentary Indians may be considered as fairly well defined by sandy deserts, which separate them from one another. Through some of these deserts wide trails, that may be called roads, were traced in course of time by lines of trade and barter, while similar trails also connected neighboring settlements. Thus, in Rimac valley, where the soil is frequently swampy, the lines of travel appear for distances elevated above the surface. The native wended his way over a long, narrow ribbon-like trail, similar to a terrace encased between adobe walls. The supposed "Inca roads" on the coast are in fact anterior to the time of the Incas. They were marked out by the tribes of the coast and kept up by frequent use. After the Incas had overpowered the coast people and partly annihilated them, they followed the lines of communication already established for the sake of their own convenience.

The stupendous population ascribed to the coast valleys in ancient times appears justified at first sight by the extent and character of the different settlements; but aside from the fact that these settlements were far from being contemporaneous, an examination and detailed survey of the ruins prove that they were very far from harboring the numbers of inhabitants which they have been usually believed to contain. Chan-chan, near Truxillo, has been credited with hundreds of thousands at least, while from the plan sent in by Bandelier to the American Museum, on which is noted every wall still visible, it may be seen

at a glance that, even ascribing to the settlement the greatest possible expanse for courts and garden beds and allotting to each individual a minimum of space, Chan-chan could never have contained 50,000 people in all, while the population of Irma or Pachacamac was even less in proportion. Another fact which hitherto has been overlooked is that Chan-chan, for instance, includes cultivated lots and fields, and that the latter occupy by far the greater portion of the area covered by the ruins. It was the home not of a town or city population, but of the entire tribe, to which the name of Chimú has also been applied.

Adobe is the material generally used in the construction of the ancient edifices, although there is hardly an extensive ruin on the coast that does not contain walls of stone also. The work on such stone constructions is fair; the blocks of stone were broken, not cut, and are laid in adobe mortar. Aside from adobes proper, so-called *terrónes* or *cajon* work is also met. The adobes are usually of larger size than those made today, and they contain traces of indigenous grass. The walls are frequently daubed over with clay, the plastering being painted in white, Indian red, and yellow ocher. Other tints may also have been used, but the excavations have not yet revealed them.

The adobe walls are usually of remarkable thickness. At Irma or Pachacamac the great wall barring access to the place from the north is twenty feet thick, and walls of eight, ten, and more feet in width are not uncommon. In that ruin, as well as in the remains of ancient Surco, near Chorrillos, the size of the rooms appears disproportionately small in relation to the thickness of the walls. The latter also taper at the top, and the thought has been suggested to Bandelier that they had no other roofs than perhaps a covering of mats. Such a shade would be perfectly sufficient in the climate of the coast, where rains are very rare, though not absolutely wanting, as is sometimes believed. Buildings of more than one story are seldom found and these always appear to be an exception to the general type.

Artificial platforms and mounds are very common; indeed where the ground is low and swampy they appear to be the rule. Furthermore, every ruin occurring on dry and solid soil that has been examined has several tall artificial mounds within its area; some of these show traces of smaller buildings on the summit or on the sides, while others are so far destroyed that it is no

longer possible to determine whether they also bore edifices of some kind.

In Rimac valley and in those portions of the valley of Truxillo and of Chicama where the artificial platform or platform-mound prevails as a type, an examination of its structure was frequently possible. Mr Henry Bruening, one of Bandelier's friends and collaborators (now returned to Germany), had several of these structures cut through to the core in accordance with Bandelier's suggestion, and the mass invariably proved, as had been noticed at the hacienda of Lince near Lima, and elsewhere, to consist of a network of adobe walls forming what appeared to be numerous chambers, but which in reality were densely packed with earth or gravel, according to the greater or less convenience of one or the other material. The bottoms are frequently gravelly, and the drift was gathered in order to render the soil more suitable for cultivation and afterward used for solidifying the bases on which the Indian reared his abode. Around the mass of adobe walls filled in with earth or clay, a plating, so to speak, of adobe of greater or lesser thickness was built, this plating being applied so as to form an inclined plane, thus giving the mound a tapering form toward the top. This mode of construction (which also explains the chambered mounds in Gila valley, Arizona, regarded as many-storied houses when first noticed), as well as the great thickness of the walls, doubtless owe their origin to the frequency and violence of earthquakes on the Peruvian coast.

In the very center of such mounds, when completely excavated or removed, features were observed that recall forcibly the New Mexican Indian custom of giving to each inanimate object its heart. In some instances round columns formed a kind of an interior niche; in others, a small chamber contained urns or jars with maize-meal. A remarkable and very significant feature was observed by the explorer in a partly ruined mound at Chan-chan. The core of this structure when opened showed two well preserved altars of adobe. In such interior apartments figurines of metal, clay, or wood are almost invariably found, and the materially valuable finds made in Peruvian ruins in earlier times came from the "heart" of one or the other of the artificial elevations described.

The size of some of these mounds is surprisingly great. In periphery possibly none of them equals the mound of Cholula,

but several approach it very closely in height. The largest of these structures are the so-called Huaca del Sol, a gigantic pile of adobe-bricks near Moche, in Truxillo valley, and the colossal mounds near Tambo de Mora, in the valley of Chincha. The documentary information regarding the purpose of these edifices is yet too fragmentary to afford much information. Many artefacts, human remains, etc, have been sent by Bandelier from these ruins to the American Museum of Natural History, where a portion of them are now on exhibition.

The aboriginal idioms of the coast, we are informed, have not completely disappeared. The Moch dialect or language is still occasionally heard in the vicinity of Truxillo, and the Indians of Eten, Ferreñafe, Monsefú, and even of Lambayeque preserve their original language, although they seldom use it in the presence of strangers. The Quichua, also formerly spoken, has almost entirely disappeared on the coast. Local names abound, both in the coast idioms and in the Quichua tongue, the latter being considerably modified through contact with the coast languages, as well as through the introduction of Spanish. Of ancient creeds and beliefs, the practice of witchcraft seems to be the only vestige. Sorcerers, practicing their art in the primitive method, are found chiefly in the northern coast pueblos, and they are not unfrequently sought from distant points in order to discover lost or stolen articles, or even for the purpose of healing and curing. Their performances recall those of the medicine-men of northern tribes in general.

Flattening of the occiput seems to have been a common custom among the ancient inhabitants of Truxillo valley. All the crania recovered by Bandelier in that locality show that peculiarity. Unfortunately, the collection of crania made at Chan-chan was lost while deposited for safe-keeping with the departmental authorities of Libertad.

After successively exploring the ruins of the Lince, of Surco and Magdalena in Rimac valley, of Irma or Pachacamac in the vale of Lurin, of Ronceros and Cerro de Tiza in the neighborhood of Pisco, of the levels about the upper course of Pisco river, the admirably preserved buildings of Tambo Colorado and the ruins of Humay still higher up; and after making, finally, a complete survey of the ruins of Chan-chan, it was determined to reconnoiter the upper course of Marañon river on the eastern slope of

the Cordillera in the Peruvian north, whence the reports about the ruins at Kue-lap had created great interest.

The journey to these rugged and little visited districts carried the explorer through the historically celebrated town of Cajamarca. Very few vestiges of the former village of that name now remain, but Bandelier has noted that the extent of the pueblo may still approximately be traced, and that it does not bear favorable comparison in point of size with the present town of 12,000 inhabitants. Of architectural remains, the so-called house of Atahualpa is the best known specimen. The lower part of the walls of this quite small building show the peculiar type characteristic of the ruins at Cacha, Cuzco, and in the Inca region proper. The blocks forming the walls are irregular in form, sometimes trapezoidal and with reëntering angles, the surface slightly salient above the edges, and most neatly fitted through careful attrition, so that there was no need of binding material. An adobe structure with a gable, on the Cerro de Santa Apolonia, is also ascribed to the period antedating the conquest, as well as a stone "seat" near by.

The gable roof alluded to is characteristic of the ruins in the Sierra and even in the *quebradas* leading directly up from the coast. The ruins in these narrow and picturesque gorges are not very numerous, and form but very small groups. On the high crests, as at Chuqui-Manga, for instance, and at elevations that seem at first sight to approach the snow-line (while in reality they are yet far below), more extensive ruins are found.

As the season was too far advanced to permit an investigation of the region of Cajamarca and Cajatambo, Bandelier was forced to hasten toward the Amazon in order to reach Chachapoyas before the torrential rains commenced. It so happened, however, that the rains began much earlier than usual and with uncommon force; still he crossed the Marañon at Balsas, reached Chachapoyas, and thence went to Kue-lap.

The department of Amazonas, of which Chachapoyas is the capital, Bandelier regards as perhaps the most broken and accidented country that he has ever seen, the highest regions of the Bolivian cordillera excepted. While not a single height east of the Marañon reaches the snow-line, traveling there is almost an uninterrupted clambering up and down, and the valleys are so narrow that they might more appropriately be called gorges. In the bottoms sugar, plantains, even coffee, may be cultivated, while

tropical forests with ferns of gigantic size are not uncommon. But as the eye sweeps upward along the steep slopes, it successively glances over all the zones of vegetation to the coldest crests of the Jalca or Puna, where only potatoes can successfully be grown, and even higher to the grassy and chilly levels, yet decked with diminutive flowers, of the culminating ridges.

The ruins lie mostly on the steep slopes and higher ridges, and even at an altitude of 9,000 feet and more they are buried beneath a mass of thorny shrubbery, shaded by tall trees. Kue-lap is almost unexplorable, so densely is it covered with forbidding vegetation, while even these difficulties were increased through the numerous thunder-showers that interrupted work at every step. Yet Bandelier succeeded in obtaining a complete plan, as well as a number of details, and in making some excavations. The result has proven that the reports about Kue-lap, as well as the so-called plans and surveys heretofore made, are utterly erroneous, and therefore that the conceptions of size and type of construction are correspondingly false. Kue-lap was a village of circular houses of stone, built without order in distribution on the level of a tall and rocky crest. This crest rises by tall steps, precipitous in many places, which makes Kue-lap perhaps one of the strongest natural points for defense which Indians ever selected for their abode. In order still further to increase their safety, the natural faces of these steps were plated, so to say, by fairly well constructed walls of stone, in places as high as fifty feet and about three feet in thickness. These walls have been described as artificial terraces of enormous thickness, but they are merely facings, made not exclusively for inaccessibility but more especially to guard against slides which the formidable rains of that section would inevitably produce. The houses are small and circular; rude decorations are sometimes found on the exterior. In many cases the natural rock forms the rear wall, as moisture and vegetation have wrecked everything of easy decay. Artefacts are not abundant, and only a small collection was secured. The crania are not deformed. The burials were found in the ground at the base of the great mural facings and also in niches opened in the facings themselves.

While in the department of Amazonas Bandelier succeeded in gathering a number of traditions relative to occurrences anterior even to the time when the Incas began to raid across the Marañon. The ultimate fate of Kue-lap is one of the subjects of these folk-



tales. It is the old story of intertribal warfare, of constant harassing, unsuccessful attacks, and, finally, of a successful surprise of the impregnable site and the slaughter and dispersion of its people.

At present a dialect of the Quichua language is spoken in these regions, but there are a number of local names that cannot be etymologized by means of that idiom, not even by making the greatest allowance for corruption. Names like Kue-lap, Cam-djian, Levanto, Lamud, etc, are not Quichua. Strange it is that one of the ruins between Chachapoyas and Kue-lap is called Aymará-bamba ("plain of the Aymarás"), and that the word Chachapoyas itself is etymologizable more easily and more plausibly through the Aymará than through the Quichua language.

After exploring as well as possible the ruins of Kue-lap, Shundur, Lirio, Aymará-bamba, Pucará, Macro, Cháuar, and visiting the Inca remains at Puma-cocha, rains and illness fairly drove the explorer back to Cajamarca. At Balsas, on the Marañon, he explored the ruins of Bambanej, as well as at two other points, thus obtaining data regarding the nature of the remains on the upper course of that river also. At Cajamarca the weather became worse, and only with difficulty and with disagreeable consequences to his health could Bandelier explore the artificial caves at the Ventanillas and Otuzco and the burials at Yerbabuena. As the rainy season had fully set in, there was nothing left him but to return to the coast to recuperate his utterly broken health. He reached Lima again on November 21, 1893.

Several months after Bandelier's return, the American Museum of Natural History of New York city took charge of the enterprise initiated so generously by Mr Villard. In the meantime the political horizon in Peru assumed a seriously threatening appearance; a general disturbance was imminent, and with such a danger ahead, any attempt at scientific work in that country would have been impossible. It was therefore necessary to look for a field of operations in a locality not immediately exposed to revolution or foreign warfare. Bolivia, whither he had intended to direct his steps in the beginning, was and has so far remained quiet and at peace with her neighbors, and although the field of research in Bolivia is much more difficult, as well as less "showy" than that in Peru, it was resolved to proceed thither. Unfortunately for the work, however, Bandelier's party

did not escape even in Bolivia from the evil effects of the Peruvian civil commotion.

The explorations were directed first to Tiahuanaco, a preliminary reconnoissance of that site being conducted, and afterward some of the upper slopes of Illimani were investigated. Finally it was decided to settle on the island of Titicaca, where the Peruvian civil war kept Bandelier and his party blockaded for three months and a half, when they were compelled to flee from that island, owing to an uprising of the Indians on the Peruvian shores of the lake. Retiring under protection of Peruvian forces to Puno, he surveyed the ruins of Sillustani. Favored with the loan of a hand-wheel boat by friends at Puno, he returned to Titicaca, and from there went to Koati. With considerable difficulty, it became possible, through the assistance of the Bolivian authorities, to reach the mainland again at Chililaya, where a time was employed in excavation.

Returning to La Paz after an absence of nine months in the field, another journey was made to the slopes of Illimani in order to establish on its southern declivities the uppermost limit of sedentary occupancy in ancient times. In this Bandelier was successful, the limit having been found to be about 14,500 feet. In November, 1895, the party returned to Lima, where ten months were consumed in the preparation of maps, plans, and the monograph on the two islands previously alluded to.

In October, 1896, Bandelier again returned to La Paz, this time with the intention of remaining in Bolivia as long as possible. His first journey from this point was to the base of the great peak called Ka-ka-a-ka or Huayna Potosi, where, at an altitude of about 15,400 feet, he remained for two months, being most of the time blockaded by incessant snowfalls. His object was realized, nevertheless, for he satisfied himself that the tin which constitutes one of the elements of ancient bronze was not taken from that highly stanniferous region. From the Huayna Potosi, after having determined through several partial ascensions the limits of perpetual snow, Bandelier accepted the invitation of a friend to remain on the peninsula of Huata and investigate its ruins. Three months were devoted to this work, the weather in the meantime greatly impeding progress. At last accounts Bandelier was making preparations for a journey to Pelechuco, in the province of Caupolican, in the northwestern corner of Bolivia, where he hoped to spend the remaining half of the year.